AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-5 (canceled).

Claim 6 (new): A method of driving an ultrasonic transducer comprising the steps of:

providing a piezoelectric resonator including a pair of electrodes sandwiching a piezoelectric body, and a backing layer disposed in contact with one of the pair of electrodes of the piezoelectric resonator and having the same acoustic characteristic impedance as the piezoelectric body; and

driving the ultrasonic transducer so as to satisfy a condition:

$2Th \leq Td \leq 6Th$

where Th is a propagation time of an ultrasonic wave in the piezoelectric body sandwiched by the pair of electrodes, and Td is a pulse width of a drive pulse driving the piezoelectric resonator.

Claim 7 (new): The method of driving an ultrasonic transducer according to Claim 6, further comprising the step of:

setting a thickness of the piezoelectric body and a thickness of the backing layer so as to satisfy a condition:

$Td < (2L2 + L1)/V$

where L1 is a thickness of the piezoelectric body, L2 is a thickness of the backing layer, and V is a sound speed when an ultrasonic wave propagates in the piezoelectric body and the backing layer.

Claim 8 (new): The method of driving an ultrasonic transducer according to Claim 6, wherein

when a pair of the piezoelectric resonators are arranged so as to sandwich a substance to be an ultrasonic transmission target, the method further comprises the step of:

configuring the ultrasonic transducer so as to satisfy a condition:

$(R^2 + X^2)^{1/2} - X > (VM \times Td)$

where X is a distance between the pair of piezoelectric resonators, 2R is a length of a short side or a diameter of an ultrasonic wave emission surface of each of the pair of piezoelectric resonators, VM is a sound speed of an ultrasonic wave propagating in the substance, and λ is a wavelength of the ultrasonic wave propagating in the substance, represented by $\lambda = (VM \times Td)$.

Claim 9 (new): The method of driving an ultrasonic transducer according to claim 6, wherein

when a partition wall made of a substance different from a substance of an ultrasonic wave emission surface of the piezoelectric resonator and a substance to be a target of ultrasonic transmission is provided, the method further comprises the step of:

setting a thickness of the partition wall so as to satisfy a condition:

$Td < 2Lw/Vw$

where Lw is a thickness of the partition wall, and Vw is a sound speed when an ultrasonic wave propagates in the partition wall.

Claim 10 (new): The method of driving an ultrasonic transducer according to Claim 9, wherein

the setting step is determined such that an acoustic characteristic impedance of the partition wall has a value between an acoustic characteristic impedance of the piezoelectric resonator and an acoustic characteristic impedance of the substance to be a target of ultrasonic transmission.

Claim 11 (new): The method of driving an ultrasonic transducer according to Claim 6, wherein the step of driving the ultrasonic transducer satisfies a condition:

$2Th \leq Td \leq 3Th$

where Th is the propagation time of an ultrasonic wave in the piezoelectric body sandwiched by the pair of electrodes, and Td is the pulse width of a drive pulse driving the piezoelectric resonator.

Claim 12 (new): A method of driving an ultrasonic transducer comprising the steps of:

providing a piezoelectric resonator including a pair of electrodes sandwiching a piezoelectric body, and a backing disposed in contact with one of the pair of electrodes of the piezoelectric resonator and having the same acoustic characteristic impedance as the piezoelectric body; and

driving the ultrasonic transducer so as to satisfy a condition:

$2Th \leq Td \leq 6Th$

where Th is a propagation time of an ultrasonic wave in the piezoelectric body sandwiched by the pair of electrodes, and Td is a pulse width of a drive pulse driving the piezoelectric resonator.

Claim 13 (new): The method of driving an ultrasonic transducer according to Claim 12, further comprising the step of:

setting a thickness of the piezoelectric body and a thickness of the backing layer so as to satisfy a condition:

$Td < (2L2 + L1)/V$

where L1 is a thickness of the piezoelectric body, L2 is a thickness of the backing layer, and V is a sound speed when an ultrasonic wave propagates in the piezoelectric body and the backing layer.

Claim 14 (new): The method of driving an ultrasonic transducer according to Claim 12, further comprising the steps of:

providing a pair of the piezoelectric resonators arranged so as to sandwich a substance to be an ultrasonic transmission target; and

configuring the ultrasonic transducer so as to satisfy a condition:

$(R^2 + X^2)^{1/2} - X > (VM \times Td)$

where X is a distance between the pair of piezoelectric resonators, 2R is a length of a short side or a diameter of an ultrasonic wave emission surface of each of the pair of piezoelectric resonators, VM is a sound speed of an ultrasonic wave propagating in the substance, and λ is a wavelength of the ultrasonic wave propagating in the substance, represented by $\lambda = (VM \times Td)$.

Claim 15 (new): The method of driving an ultrasonic transducer according to claim 12, further comprising the steps of:

providing a pair of the piezoelectric resonators;

providing a partition wall made of a substance different from a substance of an ultrasonic wave emission surface of the piezoelectric resonators between the pair of piezoelectric resonators;

providing a substance to be a target of ultrasonic transmission between the pair of piezoelectric resonators; and

setting a thickness of the partition wall so as to satisfy a condition:

$Td < 2Lw/Vw$

where Lw is a thickness of the partition wall, and Vw is a sound speed when an ultrasonic wave propagates in the partition wall.

Claim 16 (new): The method of driving an ultrasonic transducer according to Claim 15, wherein the setting step is determined such that an acoustic characteristic impedance of the partition wall has a value between an acoustic characteristic impedance of the piezoelectric resonators and an acoustic characteristic impedance of the substance to be a target of ultrasonic transmission.

Claim 17 (new): The method of driving an ultrasonic transducer according to Claim 12, wherein the step of driving the ultrasonic transducer satisfies a condition:

$2Th \leq Td \leq 3Th$

where Th is the propagation time of an ultrasonic wave in the piezoelectric body sandwiched by the pair of electrodes, and Td is the pulse width of a drive pulse driving the piezoelectric resonator.

Claim 18 (new): The method of driving an ultrasonic transducer according to Claim 12, further comprising the step of providing a thin outer layer disposed in contact with the other of the pair of electrodes of the piezoelectric resonator and having the same acoustic characteristic impedance as the piezoelectric body.

Claim 19 (new): The method of driving an ultrasonic transducer according to Claim 14, wherein the substance is a liquid.

Claim 20 (new): The method of driving an ultrasonic transducer according to Claim 15, wherein the substance is a liquid.

Claim 21 (new): The method of driving an ultrasonic transducer according to Claim 15, wherein the partition wall is a pipe disposed between the pair of piezoelectric resonators, and the substance is disposed within the pipe.

Claim 22 (new): The method of driving an ultrasonic transducer according to Claim 15, wherein the partition wall is made of polycarbonate.

Claim 23 (new): The method of driving an ultrasonic transducer according to Claim 15, wherein the partition wall is made of a liquid crystal polymer.

Claim 24 (new): The method of driving an ultrasonic transducer according to Claim 10, wherein the partition wall is attached to the pair of piezoelectric resonators with an adhesive.